

## User's guide for BIOMASUD platform

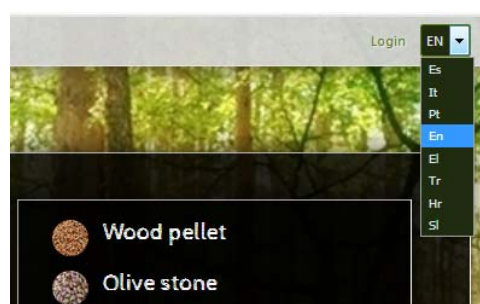
This Web App is intended to improve producer's staff interactivity with on-line platform <http://trazabilidad.ciemat.es/> allowing them calculate easily the total value of multiple biomass calculations of GHG emissions along the supply chain without the need to hire expert personnel or use external tools, and also displaying more information about related calculations like energy demand, percentage of energy demand and saving percentage.

In addition, final users can use the App to know the traceability of their purchased solid biofuels, allowing them to calculate its carbon footprint and its economic savings compared to fossil fuels.

Upon connecting to the platform, the following splash screen is shown:



On the top-right corner there is a selection box for choosing the desired language:



The currently supported languages are Spanish, Italian, Portuguese, English, Greek, Turkish, Croatian and Slovenian.

## The Menu bar

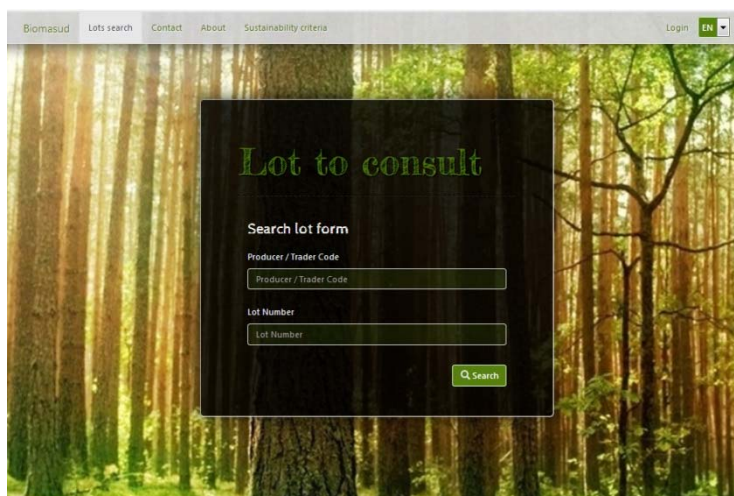
The menu bar has tabs intended for:



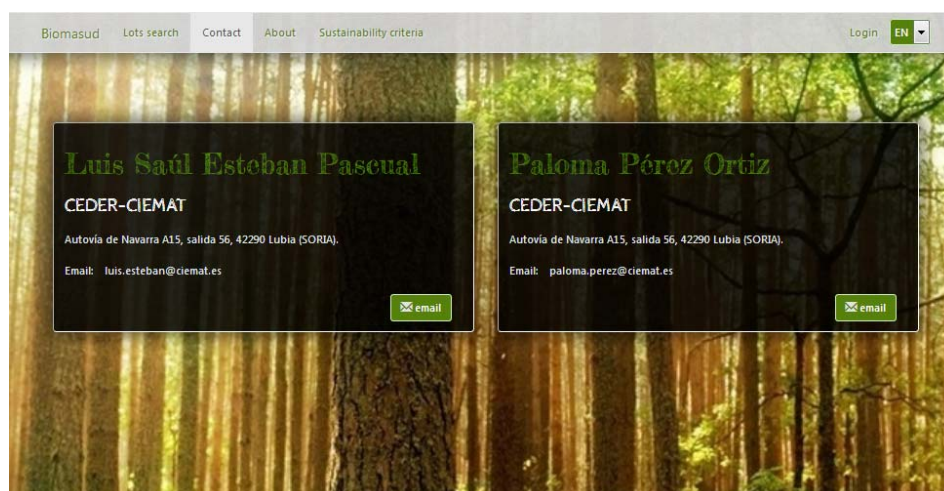
Enter to the Biomassud official webpage:



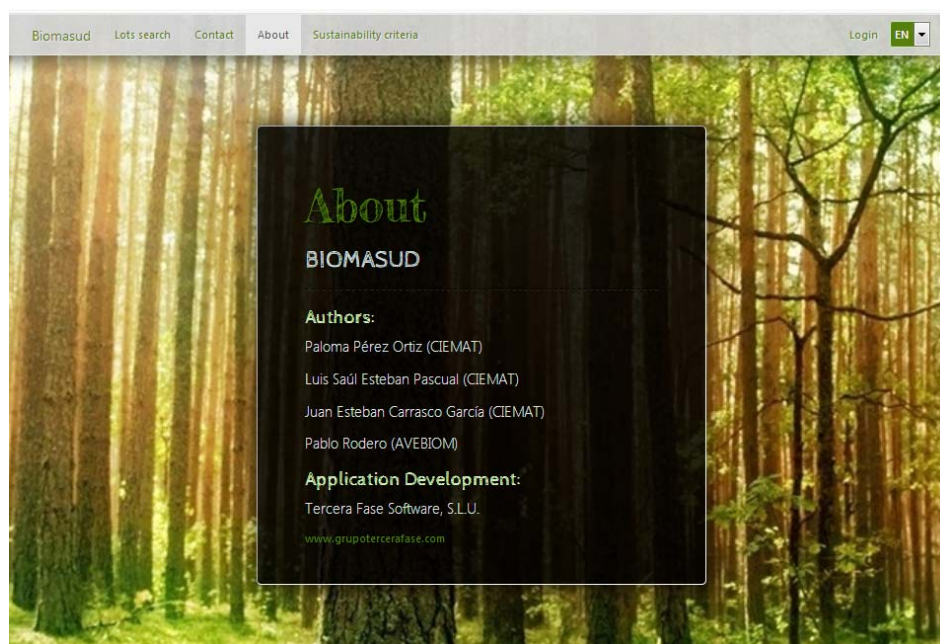
Search for Biomassud fuel lots:



Application contacts:



Information about the application,





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### Definitions

The following definitions will apply to BIOMASUD certification scheme:

N°	Biomass Categories	Definition	i.e. Materials
1	Woody biomass from forest and other wooded land management.	Roundwood, peaks, branches, stumps or root systems, trees and primary felling residues sourced directly from forest or other wooded land.	Sliver, wood pellets, firewood
2	Woody biomass from Urban or Agricultural areas	Roundwood, peaks, branches and trees produced during the course of managing urban areas or agricultural areas.	Wood (wood from urban areas, olive pruning, vineyard pruning), bark
3	Non Wood agricultural residues	Residues directly from agricultural areas. Short rotation crops are excluded, with the exception of the residues hereof.	Stalks, straws.
4	Secondary and tertiary agro-forestry materials	Waste flows and residues from agri-food and wood industry (secondary residual waste) and tertiary residual waste such as post-consumer wood waste.	Pineapple shells, almonds, pistachios, pine cones, corn cobs, olive stones.

### Summary of principles and applicable criteria

SUSTAINABILITY PRINCIPLES	Criterion	INDICATORS	Woody biomass from forest and other wooded land management	Woody biomass from Urban or Agricultural areas.	Non Wood agricultural residues	Secondary and tertiary agro-forestry materials.
GHG Principle	C1.1 Ensuring reduction	GHG I1.1.1: The reduction of greenhouse gas emissions thanks to the use of certified biomass as a substitute for natural gas shall be a minimum of 70%. It takes into account the emissions produced when transporting the raw materials to the manufacturing facility and those generated in the process of preparing and conditioning the biofuel.	YES	YES	YES	YES
ENERGY DEMAND Principle	C2.1 Reduced Demand	E2.1.1 The energy used in transporting raw materials to the production facility and the energy used in the process of preparing and conditioning biofuel may not exceed 40% of the energy contained in the fuel (PCI on wet basis).	YES	YES	YES	YES
Prevention of Illegal Logging	C3.1. Implementation and maintenance of a Due	B1.1.1 A recognized PEFC, FSC or equivalent certificate is in force. In B1.1.2 A Due Diligence	YES	n/a	n/a	n/a

## Access to the login form.

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## Login

### Login form

User

Password

☐ ¿Forgot your account?

☐ ¿Forgot your password?

And the language selection box that has been already explained.

Any person can calculate the footprint of his purchased Biomassud fuel without login in, just clicking **To access**.



All professional registered users must login into the system to allow them to use the additional functions provided by their profile privileges, as set by the administrators.



When an user is logged-in, its name appears in the menu bar, as the new functions available for him



The Administrator profile allows editing of GHG emissions related factors to perform all calculations. This includes the appropriate section on the platform to do it friendly.

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## Configuration

Biofuel type	CO <sub>2</sub> emissions in transportation gCO <sub>2</sub> -eq/kg.km	
Almond shells	0.13	Edit
Pinecone shells	0.13	Edit
Olive stones	0.08	Edit
Woodchips	0.2	Edit
Mixture	0.13	Edit
Pistachio shells	0.13	Edit
Pinenut shells	0.13	Edit
Hazelnut shells	0.13	Edit
Pellets	0.1	Edit
Walnut shells	0.13	Edit

## Production factors

Biofuel type			
Additive (vegetable oil)	1870	gCO <sub>2</sub> -eq/kg	Edit

## Production factors

Biofuel type			
Additive (vegetable oil)	1870	gCO <sub>2</sub> -eq/kg	Edit
Additive (grains)	925	gCO <sub>2</sub> -eq/kg	Edit
Additive (corn starch)	1200	gCO <sub>2</sub> -eq/kg	Edit
Sawmill wood chips/Sawdust loading	1	MJ/MJbiomassInput	Edit
Sawmill wood chips/Sawdust transportation (truk - ship)	1	MJ/MJbiomassInput	Edit
Wood chips from forestry residues (chipping)	0.9756	MJWoodChips/MJFR	Edit
Wood chips from forestry residues (seasoning)	0.95	MJFR/MJFRInput	Edit
Wood chips from forestry residues (collection)	1	MJFR/MJFRInput	Edit
Wood chips from forestry residues (transportation of wood chips)	1	MJWoodChips/MJWoodChips	Edit

### ***Results achieved***

TFS have implemented a simple solution for producer's staff that not requires technical or mathematical skills and in turn, covers the emission calculation requirements leaving behind complex spreadsheets and formulas, expanding the platform possibilities.

- A list of calculation types to evaluate agro-Industrial, agricultural, and wood chips residues.
- An extended list of biomass types: olive stones, almond shells, hazelnut shells, pinenut shells, pinecone shells, pistachio shells, walnut shells, olive tree prune, vineyard prune, forestry residues, stemwood, woodchips, sawdust.
- A list of processing types: chipping in the field and chipping at the production plant.
- Calculation from processing of biomass, including different steps like collection, seasoning and harvesting.
- Calculation from transport values: loading and unloading of residues.
- Calculation from electric consumption.
- Calculation from energy consumed by heat.
- Calculation from additives.
- Calculation from bagging: bulk product and bagged product.

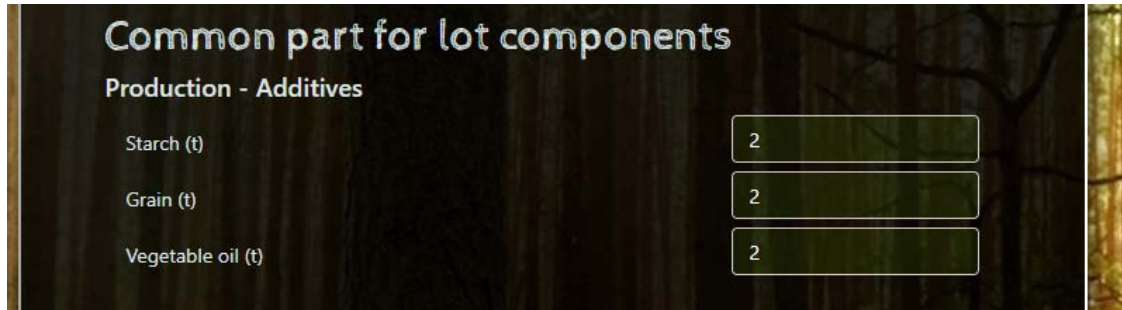
The results obtained are: GHG emissions in gCO<sub>2</sub>eq/kg, saving percentage, Energy demand in MJ/kg and percentage of energy demand. They are available for electricity and heat on bulk product and on bagged product.

## ***The calculation process***

Producer's staffs have to follow simple steps to accomplish the calculation process.

### **Common part for lot components:**

- Set biomass additives in production values (if applicable): starch, grain and vegetable oil.



**Common part for lot components**

**Production - Additives**

Starch (t)	2
Grain (t)	2
Vegetable oil (t)	2

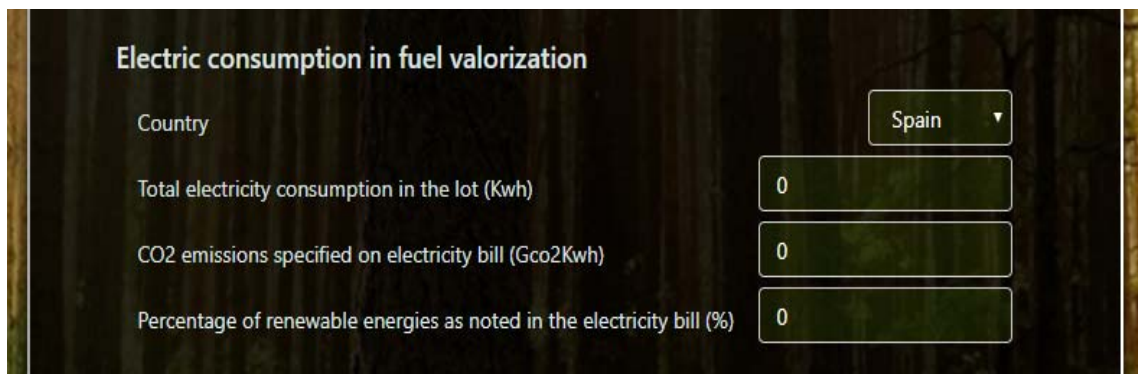
- Set bagging values (if applicable): bagging of pellets 10/15kg bag



**Bagging**

Pellets 10 kg bag (t)	0
Pellets 15 kg bag (t)	0


- Set electric consumption in fuel valorization values: country, total electricity consumption in the lot, CO2 emissions specified on electricity bill, percentage of renewable energies as noted in the electricity bill.



**Electric consumption in fuel valorization**

Country	Spain ▼
Total electricity consumption in the lot (Kwh)	0
CO2 emissions specified on electricity bill (Gco2Kwh)	0
Percentage of renewable energies as noted in the electricity bill (%)	0

- Set from production to final user values. Average distance of transportation (from production plant to the final user), energy efficiency, delivery format (bulk or bagged product), dedicated to electricity.



**From production to end user**

Average distance of transportation (from production plant to final user) (Km)	0
Energy efficiency (%)	85
Delivery format	Bulk ▼ Electricity ▼
Dedicated to electricity (%)	0



### Select de calculation type:



The screenshot shows the 'Biomass' section of a software interface. It has a 'Production calculation' button and a 'Biomass type' dropdown menu. The dropdown menu is open, showing four options: 'Agro-Industrial residue' (highlighted in blue), 'Agricultural residue', 'Wood chips', and 'Olive stones'.

There are three types of calculation available:

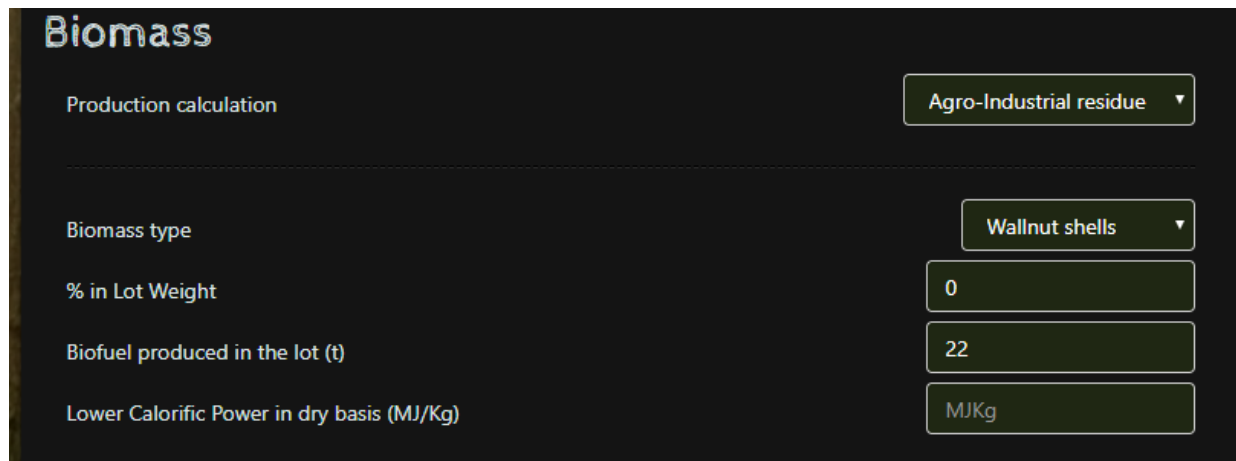
- Agro-Industrial Residues.
- Agricultural Residues.
- Wood chips.

### Agro-Industrial residues

The following biomass types are available to select: Olive stones, almond shells, hazelnut shells, pinenut shells, pinecone shells, pistachio shells, walnut shells.

To perform the calculation:

- Set the biomass type, the percent in Lot Weight, the amount of biofuel produced in the lot (t) and lower Calorific Power in dry basis (MJ/Kg)



The screenshot shows the 'Biomass' section with the following inputs: 'Production calculation' button, 'Agro-Industrial residue' dropdown, 'Biomass type' dropdown set to 'Walnut shells', '% in Lot Weight' input field with '0', 'Biofuel produced in the lot (t)' input field with '22', and 'Lower Calorific Power in dry basis (MJ/Kg)' input field with 'MJKg'.

- Set transport of biomass supply values (if applicable). Amount transported in tons and distances in kilometres for each means of transport.



The screenshot shows the 'Transportation' section with six input fields for distances in kilometers (Km): 'Amount transported (t)' (t), 'Medium-distance transportation (road-40 t truck) (Km)' (Km), 'Medium-distance transportation (road-12 t truck) (Km)' (Km), 'Medium-distance transportation (coastal/river) (Km)' (Km), 'Medium-distance transportation (ocean) (Km)' (Km), and 'Medium-distance transportation (rail) (Km)' (Km).

- Set energy consumed by heat, etc. in production values (if applicable). By-products biomass (wood, bark,...), heavy oil, fossil gas, diesel, coal (hard coal), coal (lignite), district heating (renewable) and district heating (fossil).

Production - Energy consumed by heat, etc	
By-products biomass (wood, bark,...) (Kg)	<input type="text" value="Kg"/>
Heavy oil (L)	<input type="text" value="L"/>
Fossil gas (Kwh)	<input type="text" value="Kwh"/>
Diesel (L)	<input type="text" value="L"/>
Coal (Hard coal) (t)	<input type="text" value="t"/>
Coal (Lignite) (t)	<input type="text" value="t"/>
District heating (renewable) (Kwh)	<input type="text" value="Kwh"/>
District heating (fossil) (Kwh)	<input type="text" value="Kwh"/>

### Agricultural residues

The following biomass types are available to select: Olive tree prune and vineyard prune.

The steps to perform de calculation are similar than Agro-Industrial residues explained before.

Olive tree prune ▼

Olive tree prune

Vineyard prune

### Wood chips

The following biomass types are available to select: Stemwood, wood chips, sawdust and forestry residues.

The steps to perform de calculation are similar than Agro-Industrial residues explained before, with the introduction of *Processed* section to apply on Stemwood and forestry residues biomass. This section calculates the emissions depending on where is processed (chipping in the field or at the production plant), changing the fields where moisture content should be fill.

### Stemwood-Chipping in the field:

- Set moisture content: at harvesting, in storage, at transportation, after chipping, at transportation of wood chips.
- Stemwood chips transportation (%): Medium-distance transportation (road-40 t truck), medium-distance transportation (road-12 t truck), medium-distance transportation (coastal/river), medium-distance transportation (ocean) and medium-distance transportation (rail) (Km)

Process type	Stemwood (chipping in the field) ▼
<b>Moisture content</b>	
Moisture content at harvesting (%)	%
In storage (%)	%
Moisture content at transportation (%)	%
Moisture content after chipping (%)	%
Moisture content at transportation of wood chips (%)	%
<b>Transportation</b>	
(Transport of chips from stems)	
Amount transported (t)	t
Medium-distance transportation (road-40 t truck) (Km)	Km
Medium-distance transportation (road-12 t truck) (Km)	Km
Medium-distance transportation (coastal/river) (Km)	Km
Medium-distance transportation (ocean) (Km)	Km
Medium-distance transportation (rail) (Km)	Km
<b>Stemwood chips transportation (%)</b>	
(Stems transport)	
Medium-distance transportation (road-40 t truck) (Km)	Km
Medium-distance transportation (road-12 t truck) (Km)	Km
Medium-distance transportation (coastal/river) (Km)	Km
Medium-distance transportation (ocean) (Km)	Km
Medium-distance transportation (rail) (Km)	Km

### Stemwood-Chipping at the production plant:

- Set moisture content: at harvesting, in storage, at transportation.



Process

Process type

Stemwood (chipping at the production plant) ▼

Moisture content

Moisture content at harvesting (%)

%

In storage (%)

%

Moisture content at transportation (%)

%

Stemwood-Chipping in the field:

- Set moisture content: at harvesting, in storage, at transportation, after chipping, at transportation of wood chips.
- In reception: Medium-distance transportation (road-40 t truck), medium-distance transportation (road-12 t truck), medium-distance transportation (coastal/river), medium-distance transportation (ocean) and medium-distance transportation (rail) (Km)

Process type

Forestry residues (chipping in the field) ▼

Moisture content

Moisture content at collection (%)

%

In storage (%)

%

Moisture content at transportation (%)

%

Moisture content after chipping (%)

%

Moisture content at transportation of wood chips (%)

%

Transportation

(Transport of chips from forestry residues)

Amount transported (t)

t

Medium-distance transportation (road-40 t truck) (Km)

Km

Medium-distance transportation (road-12 t truck) (Km)

Km

Medium-distance transportation (coastal/river) (Km)

Km

Medium-distance transportation (ocean) (Km)

Km

Medium-distance transportation (rail) (Km)

Km

In reception (%)

(Forest residues transport)

Medium-distance transportation (road-40 t truck) (Km)

Km

Medium-distance transportation (road-12 t truck) (Km)

Km

Medium-distance transportation (coastal/river) (Km)

Km

Medium-distance transportation (ocean) (Km)

Km

Medium-distance transportation (rail) (Km)

Km

Forestry residues-Chipping at the production plant:

- Set moisture content: at collection, in storage, at transportation.

**Process**

Process typeForestry residues (chipping at the production plant) ▼

**Moisture content**

Moisture content at collection (%)%

In storage (%)%

Moisture content at transportation (%)%

## Results

Results are dynamically updated when values change in the form and they are displayed in a table showing the energy demand (MJ/kg and percent), GHG emissions (gCO<sub>2</sub>-eq/Kg), savings of GHG emissions and total CO<sub>2</sub> emissions (gCO<sub>2</sub>-eq/Kg).

Calculated values are used by platform when users create new biomass lots to calculate the CO<sub>2</sub> emissions from biomass source to end user along the supply chain.

Results		
Demanded energy	0.19	MJkg
Demanded energy(maximum 40%)	3.77	%
GHG Emissions	89.84	gCO2eqkg
GHG emissions savings(minimum 70%)	88.47	%
Total CO2 Emitted 89.84		
		<button>Add</button> <button>Close</button>

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